

# Security Best Practices

**Play+ Security Helper : playguard Introduction** ■ In the Play+ ecosystem, security is not an afterthought; it's a foundational layer woven into every component and interaction. This helper is based on the concept of Security by Design , enabling teams to proactively mitigate common web vulnerabilities without needing to be security experts. The playguard helper provides a simple, unified API for complex security tasks like input sanitization, secure token management, and Cross-Site Scripting (XSS) prevention. This directly supports our core design pillars by making applications more Intuitive for developers to secure, more Adaptive and resilient against threats, and more Inclusive by protecting the data and privacy of all users.

**Package Info** ■ The Play+ security helper is provided via the `@playplus/security` package and is a core component of the Golden Path starter kit.

**Description** ■ Package / Path Golden Path (Recommended) Pre-installed `/system/play.security.ts` Uplift Path `npm install @playplus/security` Folder Reference ■ The security helper and its configuration follow our standardized folder structure for core system logic.

**File / Directory Purpose & Guidelines**

| File / Directory                              | Purpose & Guidelines  |
|---|---|
| <code>system/play.security.ts</code>          | The core security service. It provides methods for sanitization and authentication lifecycle management.  |
| <code>system/api/apiProxy.ts</code>           | The secure network gateway that uses playguard internally. Direct <code>fetch()</code> is not permitted.  |
| <code>config/play.security.config.json</code> | User-overridable configuration for Content Security Policy (CSP), CSRF tokens, and auth storage strategy. |

**Helper - Pillars Alignment** ■ The playguard helper is a direct implementation of our pillars, focused on creating safe and trustworthy digital experiences.

**Pillar How This Helper Aligns**

| Pillar    | How This Helper Aligns   |
|-----------|--|
| Intuitive | Primary Pillar: Abstracts complex security patterns (like token refresh, input sanitization) into simple, memorable methods. |
| Adaptive  | Builds a resilient application that can gracefully handle authentication state changes and defend against common attacks.    |
| Inclusive | Protects the data and privacy of all users by default, fostering a safe and trustworthy environment for everyone.            |

**Helper Overview** ■ The playguard helper is your application's embedded security engine. Its purpose is to abstract the plumbing of web security, making it easy for developers to build safe applications by default. It provides a simple API that handles complex operations in the background. It automates and simplifies:

- Input Sanitization** : Prevents XSS attacks by cleaning user-provided strings and HTML.
- Authentication Management** : Manages the entire lifecycle of authentication tokens (saving, retrieving, decoding, removing).
- Secure API Requests** : Works behind the scenes with the `apiProxy` to automatically attach authentication and CSRF tokens to every outgoing request.
- Centralized Configuration** : Allows security policies like Content Security Policy (CSP) to be managed from a single configuration file.

With playguard , developers don't need to worry about the correct way to store a token or how to prevent cross-site scripting. They can simply use the provided methods and trust that the system is enforcing best practices.

**Config Options** ■ Global security policies are managed in `config/play.security.config.json` .

**Config Key Table** ■

| Config Key                   | Default Value             | Description  |
|------------------------------|---------------------------|--|
| Recommended Value            | <code>csp {...}</code>    | An object defining the Content Security Policy rules. Keep as strict as possible |
| <code>csrf.cookieName</code> | <code>"csrf_token"</code> | The name of the cookie where the CSRF token is                                   |

stored. Match backend expectation csrf.headerName "X-CSRF-Token" The name of the HTTP header used to send the CSRF token. Match backend expectation auth.storage "cookie" The storage mechanism for auth tokens. "cookie" auth.tokenName "accessToken" The name of the cookie or localStorage key used to store the token. "accessToken" auth.scheme "Bearer" The authentication scheme used in the Authorization header. "Bearer" Helper Methods ■ The helper provides a clean API for general security and authentication tasks.

| Method Name                         | What It Does  |
|-------------------------------------|---|
| sanitize                            | Cleans a string to make it safe for rendering as HTML text content. Strips HTML tags.   |
| sanitize(input: string): string     | purify Strips dangerous HTML (like <script> tags and onclick attributes) from a string. |
| purify(html: string): string        | auth.saveToken Securely stores an authentication token.                                 |
| auth.saveToken(token: string): void | auth.getToken Retrieves the stored authentication token.                                |
| auth.getToken(): string             | auth.removeToken Deletes the authentication token, effectively logging the user out.    |
| auth.removeToken(): void            | auth.decodeToken Decodes a JWT payload to read claims like user roles or expiration.    |
| auth.decodeToken(): T               | auth.isAuthenticated Returns true if a valid, non-expired token exists.                 |
| auth.isAuthenticated(): boolean     |   |

React: A Custom Authentication Hook ■ This useAuth hook encapsulates all authentication logic, providing a clean interface to components.

```
// hooks/useAuth.ts
import { useState, useEffect } from "react";
import { playguard } from "../system/play.security";
import { apiService } from "../system/api/apiService";
import { apiRoutes } from "../system/api/apiRoutes";
export function useAuth() {
  const [isAuth, setIsAuth] = useState(() => playguard.auth.isAuthenticated());
  const login = async (credentials) => {
    const response = await apiService.post(apiRoutes.auth.login, credentials, { auth: false });
    playguard.auth.saveToken(response.token);
    setIsAuth(true);
  };
  const logout = () => {
    playguard.auth.removeToken();
    setIsAuth(false);
    // Redirect or clear user state here
  };
  const user = isAuth ? playguard.auth.decodeToken() : null;
  return {
    isAuthenticated: isAuth,
    user,
    login,
    logout
  };
}
```

Angular: A Self-Healing Auth Interceptor ■ This HTTP interceptor automatically attaches the auth token to requests and handles 401 Unauthorized errors by logging the user out, creating a "self-healing" session management system.

```
// core/auth.interceptor.ts
import { Injectable } from "@angular/core";
import {
  HttpInterceptor,
  HttpRequest,
  HttpHandler,
  HttpEvent,
  HttpResponse,
} from "@angular/common/http";
import { Observable, throwError } from "rxjs";
import { catchError } from "rxjs/operators";
import { playguard } from "@playplus/core";
import { playlog } from "@playplus/core";
@Injectable()
export class AuthInterceptor implements HttpInterceptor {
  intercept(
    req: HttpRequest<any>,
    next: HttpHandler
  ): Observable<HttpEvent<any>> {
    const token = playguard.auth.getToken();
    let authReq = req;
    if (token) {
      const scheme = "Bearer";
      authReq = req.clone({
        setHeaders: { Authorization: `${scheme} ${token}` },
      });
    }
    return next.handle(authReq).pipe(
      catchError((error: HttpResponse) => {
        if (error.status === 401) {
          playlog.warn("Received 401 Unauthorized, forcing logout.", { path: req.url });
          playguard.auth.removeToken();
          window.location.assign("/login");
        }
        return throwError(() => error);
      })
    );
  }
}
```

Additional Info ■ Why We Created This Helper ■ Web application security is non-negotiable but notoriously difficult to get right. Without a dedicated helper, developers would be responsible for: Remembering to sanitize all user inputs to prevent XSS. Implementing secure

storage for authentication tokens. Manually adding Authorization and CSRF headers to every API call. Writing boilerplate logic to handle token expiration and refresh cycles. This is not only repetitive but also dangerously error-prone. playguard centralizes these critical security operations into a single, tested, and easy-to-use helper, ensuring that applications are secure by default, not by chance.

**Best Practices & Developer Checklist**

- Use apiProxy for all network requests. Check: Am I using apiProxy for all network requests instead of fetch() ? Sanitize all rendered user content. Check: Is all user-generated content that will be rendered as HTML passed through playguard.purify() ? For text content, am I using playguard.sanitize() ? Enforce a strict Content Security Policy (CSP). Check: Have I reviewed the csp rules in the config to ensure they are as strict as possible for my application? Use secure cookies for token storage. Check: Is my auth.storage strategy in the config set to "cookie" for production with the HttpOnly and Secure flags set on the server? Complement client-side security with backend validation. Check: Does our backend re-validate all data and permissions, treating the client as untrusted?

**OWASP Top 10 Alignment**

- The playguard helper and associated patterns are designed to help mitigate several of the most critical web application security risks identified by OWASP.

**OWASP Risk How playguard Helps**

- A01: Broken Access Control The apiProxy pattern ensures consistent attachment of auth tokens to every request.
- A02: Cryptographic Failures Promotes secure, HttpOnly cookie-based token storage over insecure localStorage .
- A03: Injection (XSS) The sanitize() and purify() methods are the primary defense against XSS.
- A05: Security Misconfiguration Centralizes security settings like CSP and CSRF headers in play.security.config.json .
- A07: Identification Failures The auth module standardizes the token lifecycle (save, get, remove, check).